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ABSTRACT

Teachers participating in technology training must move beyond training classrooms to apply teaching methods that facilitate technology integration in their classrooms. Most adoption literature comes from proponents of innovations and outcomes resulting from applications of innovations, but more case studies of teacher experiences in technology integration processes are needed to better understand how to facilitate integration. The purpose of this study was to determine to what extent teachers: (1) alter their teaching methods; and (2) integrate technology into their classroom curriculum during and after a technology-training course designed to prepare teachers to use technologies to support their teaching and student learning. The course under investigation was offered in both online (OL) and face-to-face (F2F) delivery modes. Comparison of both modes of instruction on teacher professional development within the subject area of technology training and implementation was conducted. Case study methods were applied to gain an understanding of the experiences of teachers as they moved through an OL or F2F course designed to prepare teachers for integrating technology into the curriculum. Complementary data collection processes were used in each of the eight cases to provide depth and breadth in identifying and analyzing the barriers and processes affecting the impact of the training course. The study suggests that teachers increase their use of technology in the classroom during and after training in the process of integrating technology into the curriculum. Further, teachers do not alter their existing teaching methods as they integrate technology, but use technology in ways that support their current classroom practices. The study confirmed the existence of intrinsic and extrinsic barriers that interfere with teachers' abilities to integrate technology into the classroom curriculum. Several other factors that impact technology integration were noted in this study. (Contains 23 references.) (AEF)

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Moving Beyond the Training Environment to a Vision of Technology Integration in the Classroom Curriculum: A Case Study. (August 2001)

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Moving Beyond the Training Environment to a Vision of
Technology Integration in the Classroom Curriculum: A Case Study. (August 2001)

ABSTRACT

Teachers participating in technology training must move beyond training classrooms to apply teaching methods that facilitate technology integration in their classrooms. Most adoption literature comes from proponents of innovations and outcomes resulting from applications of innovations, but more case studies of teacher experiences in technology integration processes are needed to better understand how to facilitate integration (Willis, Thompson & Sadera, 1999).

The cases studied illuminated the processes of technology integration for elementary and secondary teachers possessing low and high levels of technology skill and use. Through this study instructors will better understand how to facilitate technology integration for different types of teachers. The study identified implications for future studies involving technology integration training and processes and also identified areas of concern in the technology integration program investigated and those individuals involved in the training and integration process.

PURPOSE OF THE STUDY

The purpose of this study was to determine to what extent teachers (a) alter their teaching methods and (b) integrate technology into their classroom curriculum during and after a technology-training course designed to prepare teachers to use technologies to support their teaching and student learning. The course under investigation was

offered in both online (OL) and face-to-face (F2F delivery modes. Therefore, comparison of both modes of instruction on teacher professional development within the subject area of technology training and implementation was conducted.

THEORETICAL FRAMEWORK

In order to investigate the processes that occur during and after technology training as individuals integrate technology into their classroom curriculum, an understanding of the current educational system as it relates to technology and teaching practices must be established. The goals of restructuring the current educational system were reviewed to gain understanding of the shift from the traditional role of teachers as purveyors of knowledge to a role that allowed for the establishment of a more learner-centered environment and the role that technology would have in establishing these new roles and supporting the new learning environments (Goals 2000, 2000; Technology Assessment [OTA], 1995; Texas Long Range Plan, 1996). The theoretical foundations of this study are therefore based on a conceptual understanding of: (a) the goals of restructuring; (b) the role of technology in restructuring; (c) the changing roles of teachers; (d) teacher training; (e) barriers to technology integration; and (f) the implementation process.

Training teachers in the processes of integrating technology must replace current practice of simply training teachers in computer applications (Brownell, 1992; Ertmer, 1999; Roblyer et al., 2000; Schrum, 1999; Simonson & Thompson, 1997). Teachers determine what happens in the classroom and how innovations are or are not implemented (Sandholtz et al., 1997). Therefore, if teachers are to move beyond the

training environment to implementation in their classroom, they must be prepared to overcome obstacles that interfere with the process. Obstacles may be intrinsic and/or extrinsic to the individuals involved. Effective training programs are needed to provide teachers with models to build their own visions of an integrated classroom (Beichner, 1993; Cifuentes, 2001; Kerr, 1996; Schrum; Studler & Wetzel, 1999).

METHODS

Case study methods (Wiersma, 1995) were applied to gain an understanding of the experiences of teachers as they moved through an OL or F2F course designed to prepare teachers for integrating technology into the curriculum. Complementary data collection processes (Shulman, 1986) were used in each of the eight cases to provide depth and breadth in identifying and analyzing the barriers and processes affecting the impact of the training course. In this study, the integration of survey, interview, and observational approaches offered the researcher an opportunity to develop a complete analysis of participant behavior from a holistic perspective (Gall, Borg & Gall, 1996).

DATA SOURCES

INST 6031: Applications of Technology, a core graduate-level course offered by the School of Education at the University of Houston – Clear Lake, introduced students to the tools and skills necessary to understand and operate computers, navigate the Internet and World Wide Web, and create hypermedia products. The course included educational applications of instructional and information technologies to promote the integration of technology into the curriculum. Emphasis was on the comprehensive integration and implementation of the Technology Applications Texas Essential

Knowledge and Skills (Texas Education Agency, 2001), Secretary's Commission on Achieving Necessary Skills (SCANS) 2000 report (U.S. Department of Labor), and those tools that have important implications for the creation of products with the technology. The course was offered either in an OL format or in a traditional F2F setting. The OL course met for an initial orientation session prior to the start of the semester and all other interaction was conducted on-line. The F2F course met weekly for 15 3-hour sessions. Within both delivery methods, a combination of hands-on lab assignments and content material was offered through a student-centered approach. Students and faculty worked together to identify learning requirements, learning strategies and assessment criteria based on students' prior skills and areas of interest. Students gained experience in the educational use of such technologies as productivity tools, presentation graphics, multimedia, and telecomputing technologies; however, they did so by applying tools to practical problems and opportunities as the basis for understanding, developing, and demonstrating activities that enhanced both student and teacher performance.

The PK-12 teachers enrolled in all sections of the graduate level *INST 6031:Applications of Technology* course at University of Houston – Clear Lake made up the pool of 30 participants. A computer use survey was administered and collected prior to any classroom instruction. The survey scores were based on a point value associated with the level of skills selected by the individual, levels 1 - 4 were given point values of 1 - 4 accordingly, no response resulted in zero points for that question. The participants were divided into two groups, which were representative of the participants' teaching

grade levels Elementary (PK-6) and Secondary (6-12). The Elementary and Secondary groups were then divided by course delivery method. The two course delivery methods under investigation were OL and F2F. Therefore, the cases for investigation were selected from a sample of Elementary – OL, Elementary – F2F, Secondary – OL and Secondary – F2F. A systematic sample using circular lists, rank ordered by skill level from highest to lowest composite score, was used to ensure representation of varied technology skill levels within the grade levels.

RESULTS

The study suggests that teachers increase their use of technology in the classroom during and after training in the process of integrating technology into the curriculum. Further, teachers do not alter their existing teaching methods as they integrate technology, but use technology in ways that support their current classroom practices. The study confirmed the existence of intrinsic and extrinsic barriers that interfere with teachers' abilities to integrate technology into the classroom curriculum. Several other factors that impact technology integration were noted in this study: (a) instructional approaches restricted by state-mandated objectives associated with Texas Assessment of Academic Skills (TAAS) and End of Course exams; (b) technological skill levels influenced the degree of difficulty in managing logistical issues related to technology integration; (c) career goals of the individuals influenced their integration of technology into the classroom curriculum; (d) constructivist-oriented teachers experienced less difficulty integrating technology in learner-centered activities; and, (e) simultaneous change cycles experienced by teachers affected the technology integration process.

Recommendations from this study contribute to the future development of an effective model of teacher training in technology integration for different types of teachers. This study adds to the existing literature on effective training in technology integration by focusing on the individual skills, needs, and classroom environments of those individuals involved in the training rather than the implementation of the innovation. "Cookie cutter" courses that focus on basic skills and application training will not enable the transfer of skills from the training environment to the classroom. Frequent modeling of technology-enhanced instruction directly related to the classroom environment would better facilitate transfer of technology skills and use (Studler & Wetzel, 1999). Training for technology integration must incorporate in its structure the instructional methods and classroom practices that facilitate technology integration.

This study extends the current research on the CBAM model and the process of change by focusing attention on the individual characteristics of teachers involved in a training program. Although the teachers in this study experienced similar stages of concern as they moved through the change process initiated by training, they were similar only in the sense that they defined a stage in the process of change. Concerns were affected by the individual characteristics of the teacher and their classroom environment. Resistance to change was related to the intrinsic/extrinsic barriers and concerns encountered by the individual teacher. Training courses must address the concerns and resistance of teachers moving through the various stages by involving them in the training process through collaboration and modeling. Teachers should be offered

opportunities to experience technology use and integration implementation that address their individual concerns and reasons for resistance.

Training in the integration of technology that is a combination of both integration and skills training is more beneficial than basic technology skills training alone, but technology training that is aligned with the curriculum and relevant to what teachers do in the classroom is most effective (Trotter, 1999). The findings of this study support previous findings that the individual teachers' beliefs, previous teaching experiences, content areas, and classroom environments directly impact their teaching practices and therefore influence their uses of technology integration in the classroom (Dwyer et al., 1990a, 1990b; Ertmer, 1999; Fulton, 1999; Studler & Wetzel, 1999). This study extends the literature with two additional factors that directly impact teachers' use of technology in the classroom. First, the career goals of the individual teachers not only affect how the teachers envision the use of technology in the curriculum but the extent to which they apply the skills and knowledge obtained during the training program to their current classroom environment.

Second, conflicts that occurred as teachers' experienced simultaneous multiple change processes directly impacted the teachers' skill growth, concerns, levels of use of technology integration. Restructuring of schools initiates change that affects the roles of teachers, learners, and technology in the classroom. Technology training initiates change for the individual through new skill acquisition and application. In addition, teachers experience change as they transfer the skills and knowledge gained in the training environment to the classroom. Teachers therefore may have difficulty moving through

each of the individual change processes due to difficulties or conflicts encountered in other change processes. Again, this researcher hypothesizes that the complexity of change processes toward technology integration requires a comprehensive effort.

Training program developers and instructors must address these two factors if the individuals enrolled in their programs are to move beyond training to implementation in their own environments. First, technology integration that promotes effective uses of technology in teaching and learning must be an integral part of all education programs and not limited to teacher training courses. The educational value of integrating technology into the classroom curriculum must be emphasized in all education programs. Technology integration must become a component of the entire education process and not be confined to technology training courses.

Second, to address the conflicts of multiple change processes, individuals need to be made aware of the relationship between the changing practice and their current practice. Simply training individuals in the processes of technology integration is not sufficient; training must be related to the current practices and environments of the individuals. Successful change occurs when individuals recognize the benefits and advantages that will occur as the result of change. Such recognition results from participation in coursework that models effective technology integration.

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